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TAPING DEVICE

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The present invention relates to devices for applying pressure-sensitive adhesive tape in predetermined lengths to successive articles positioned for taping; more particularly to devices of this type for applying lengths of tape around the corners of rectangular articles such as boxes or cartons for fastening the boxes together and for holding them closed.

Heretofore devices for applying tape in this manner have been manually operable, or operable in response to movement of the article to be taped past or through the taping device. In the latter case, the length of tape can only be applied to the article in the direction of movement of the article past the taping device. Thus, the only way that tape can be applied to all sides of the article by this technique is to rotate the article to present each side successively to the taping device, or devices, if more than one are used.

The present invention contemplates a fully automatic device for applying such lengths of tape to successive articles, such as boxes or cartons, positioned with respect thereto. This device comprises an automatic taping head or heads operable in response to the positioning of the article in a taping position to apply tape to the article. The movement of the taping heads is independent of the direction of movement of the articles into and out of the taping position and several heads may operate at one time to apply tape to different portions of the same article.

For instance, if the article to be taped is a rectangular box and it is desired to place L shaped lengths of tape around the corners formed between the bottom of the box and each of its two sides and two ends, four in all, two taping heads may be employed to apply automatically the L shaped lengths of tape to the box in one taping position. Then the box may be moved to a second taping position where two more heads automatically apply the remaining two lengths of tape to the box in the desired locations. All of this may be accomplished without rotating or turning the box. Thus, the box may be moved in only one direction past or through the taping device or devices by some simple automatic conveying means, such as a belt or conveyor table having driven rollers. Suitable stops, guides, or clamps controlled by contact or limit switches responsive to the location of the box may be provided for holding the box in taping position and releasing it when the desired length of tape is applied thereto.

The present invention also contemplates a novel taping head which is adapted to approach a box to be taped and, on contact therewith, automatically apply an L shaped length of pressure-sensitive adhesive tape to a corner of the box in such a way that the tape is fully adhered to the box all along its length.

Other advantages of this invention will be apparent from the following descriptions and claims taken together with the drawings wherein,

FIG. 1 is a somewhat schematic plan view of an auto-

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matic taping device according to one embodiment of this invention wherein two heads are employed in each of two taping positions.

FIG. 2 is a schematic side view in elevation of the device of FIG. 1.

FIG. 3 is a somewhat enlarged side view in elevation of one of the transverse taping heads of the device of FIG. 1, shown adjacent a box in taping position with respect to the head.

FIG. 4 is a schematic view in perspective of a box with two L shaped pieces, or clips, of tape applied to one side and one end of the box.

FIG. 5 is a similar schematic view in perspective of the box of FIG. 4 with four L shaped pieces of tape applied thereto.

FIG. 6 is a somewhat enlarged end view partly in elevation and partly in section taken along the line 6—6 of FIG. 8 of the transverse taping head of FIG. 3 and associated parts.

FIG. 7 is an end view at the same enlargement, partly in section and partly in elevation, of a portion of the head of FIG. 6 broken away to show how the head is mounted.

FIG. 8 is a top plan view of the transverse head of FIG. 3 and associated parts.

FIG. 9 is a side view in elevation of the taping head of FIG. 3 showing the head in position underneath the box as the tape is severed just prior to completion of application of the L shaped piece of tape to one corner of the box.

FIG. 10 is a broken away side view showing the mounting for the tape supply and other parts associated with the taping head of FIG. 3.

FIG. 11 is a somewhat more greatly enlarged view partly in elevation and partly in section taken along the line 11—11 of FIG. 12 and showing the tape holding device of the taping head of the preceding figures.

FIG. 12 is an end view of the same tape holding device taken along the line 12—12 of FIG. 10.

FIG. 13 is an enlarged side view partly in section and partly in elevation of means for holding the box, or carton, of FIG. 1 in the taping position.

FIG. 14 shows a taping device according to a slightly different embodiment of this invention wherein only a side guide and no side clamp is utilized to position the box for taping.

FIG. 15 is a schematic side view in elevation of a pair of taping heads according to a still different embodiment of the invention wherein two heads work on opposite sides of a box in the same taping position.

FIG. 16 is a schematic view in elevation of still a different embodiment of a taping device according to this invention wherein either an L shaped or U shaped piece of tape may be applied to a rectangular article.

FIG. 17 is a view in perspective of a box with an L shaped piece of tape applied thereto by the apparatus of FIG. 17.

FIG. 18 is a similar view in perspective of the same box with a U shaped piece of tape applied thereto.

Referring in particular to FIGS. 1, 2, 4 and 5 of the drawings there is shown a taping device according to a preferred embodiment of the invention wherein L-shaped "clips," or lengths, 21, of tape are applied to rectangular boxes 22, such as cardboard cartons, at two taping sta-